



24747-1104 2005-05-11 Sequence Listings.ST25.txt  
SEQUENCE LISTING

AgResearch

<120> Insecticidal nucleotide sequences

<130> PCT/NZ00/00174

<160> 11

<170> PatentIn version 3.3

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## 24747-1104 2005-05-11 Sequence Listings.ST25.txt

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24747-1104 2005-05-11 Sequence Listings.ST25.txt

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 <213> *Serratia entomophila*  
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Leu Arg Leu His Ala Tyr Arg Cys Ala Ala Asp Val Trp Thr Val Gly  
 20 25 30

Tyr Gly His Thr Ala Gly Val Thr Lys Gly Asp Ile Ile Thr Val Asp  
 35 40 45

Glu Ala Gln Thr Met Leu Thr Asn Asp Ile Thr Val Phe Glu Arg Ala  
 50 55 60

Val Ser Gln Ala Val Ala Val Pro Leu Asn Gln Ser Gln Tyr Asp Ala  
 65 70 75 80

Leu Val Ser Leu Val Phe Asn Ile Gly Gln Gly Asn Phe Lys Arg Ser  
 85 90 95

Thr Leu Leu Lys Lys Leu Asn Lys Gln Asp Tyr Val Gly Ala Gly Asn  
 100 105 110

Glu Phe Leu Arg Trp Thr Arg Ala Asn Gly Lys Val Leu Pro Gly Leu  
 115 120 125

Ile Arg Arg Arg Glu Ala Glu Arg Val Leu Phe Glu Lys Leu Gly Ala  
 130 135 140

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 <212> PRT  
 <213> Serratia entomophila

<400> 3

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Lys Ile His Tyr Gln Val Ala Ala Val Val Leu Thr Gly Val Met Val  
 20 25 30

Trp Gly Leu Ser His Trp Arg Tyr Thr Val Gly Tyr His Ala Ala Asp  
 35 40 45

Thr Gln Trp Gln Gln Arg Gln Ala Glu Gln Glu Arg Ala Asp Ala Leu  
 50 55 60

Ala Leu Leu Ala Ala Glu Thr Arg Glu Arg Lys Trp Glu Gln Gln Arg  
 65 70 75 80

Gln Thr Asp Met Asn Lys Val Ala Ile His Ala Glu Glu Glu Leu Ala  
 85 90 95

Ala Ala Arg Asp Ala Ala Ala Asp Ala Gln Arg Thr Gly Gln Arg Leu  
 100 105 110

Gln His Thr Val Thr Thr Leu Gln Arg Gln Leu Ala Ser Arg Glu Thr  
 115 120 125

Arg Arg Leu Ser Ala Ala Thr Ala Ile Gly Thr Asp Asp Leu Gly Gly  
 130 135 140

Gln Pro Gly Val Leu Phe Ala Glu Leu Phe Arg Arg Ala Asp Gln Arg  
 145 150 155 160

Ala Gly Glu Leu Ala Ala Tyr Ala Asp Arg Thr Arg Val Lys Trp Gln  
 165 170 175

Ala Cys Gly Arg Ala Tyr Gln Ala Ala Thr His Glu Ala Glu Lys  
 180 185 190

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 <211> 2376  
 <212> PRT  
 <213> Serratia entomophila

<400> 4

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 20 25 30  
 Leu Thr Asp Leu Phe Ser Arg Ser Phe Pro Glu Val Lys Lys Ile Thr  
 35 40 45  
 Gly Asp Ser Leu Ser Trp Gly Glu Val Cys Tyr Leu Tyr Ser Gln Ala  
 50 55 60  
 Gln His Glu Gln Lys Glu Asn Arg Leu Thr Glu Ser Arg Ile Leu Ala  
 65 70 75 80  
 Arg Ala Asn Pro Leu Leu Val Asn Ala Val Arg Leu Gly Ile Arg Gln  
 85 90 95  
 Ala Ala Gly Ser Arg Ser Tyr Asp Asp Trp Phe Gly Ser Arg Ala Asp  
 100 105 110  
 Arg Phe Ala Arg Pro Gly Ser Val Ala Ser Met Phe Ser Pro Ala Ala  
 115 120 125  
 Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Lys Asp Leu His Pro Asp Thr  
 130 135 140  
 Ser Leu Phe Arg Leu Asp Ile Arg Arg Pro Asp Leu Ala Ala Leu Ala  
 145 150 155 160  
 Leu Ser Gln Asn Asn Met Asp Asp Glu Leu Ser Thr Leu Ser Leu Ser  
 165 170 175  
 Asn Glu Leu Leu Tyr Arg Gly Ile Gly Ala Ala Glu Gly Leu Asp Asp  
 180 185 190  
 Asp Ser Val Arg Glu Leu Leu Ala Gly Tyr Arg Leu Thr Gly Leu Thr  
 195 200 205  
 Pro Tyr His Trp Ala Tyr Glu Ala Ala Arg Gln Ala Ile Leu Val Gln  
 210 215 220  
 Asp Pro Thr Leu Met Gly Phe Ser Arg Asn Pro Asp Val Ala Gln Leu  
 225 230 235 240  
 Met Asp Pro Ala Ser Met Leu Ala Ile Glu Ala Asp Ile Ser Pro Glu  
 245 250 255

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Leu Tyr Gln Ile Leu Ala Glu Glu Ile Thr Thr Asp Ser Tyr Glu Ala  
260 265 270

Leu Trp Ser Lys Asn Phe Gly Asp Met Pro Pro Ser Ser Leu Leu Ser  
275 280 285

Tyr Asp Ala Leu Ala Thr Phe Tyr Asp Leu Asp Tyr Asp Glu Leu Thr  
290 295 300

Ser Leu Leu Ser Leu Arg Leu Asp Phe Ser Asn Pro Asn Asn Glu Tyr  
305 310 315 320

Tyr Ile Asn Ser Gln Leu Ser Val Val Thr Leu Asn Glu Ser Thr Gly  
325 330 335

Leu Ile Thr Ile His His Tyr Leu Arg Thr Leu Gly Gly Asp Ser Gln  
340 345 350

Gln Ile Asn Pro Glu Leu Ile Pro Tyr Gly Asp Gly Thr Tyr Leu Tyr  
355 360 365

Asn Phe Ser Val Val Ser Thr Ile Ser Glu Asp Ser Phe Lys Leu Gly  
370 375 380

Ser Leu Gly Ser Asn Ser Ser Asn Leu Tyr Ser Gly Asp Tyr Gln Leu  
385 390 395 400

Gln Lys Gly Val Arg Tyr Ser Ile Pro Val Glu Ile Asp Glu Gly Lys  
405 410 415

Leu Asn Asp Gly Ile Thr Ile Gly Leu Ser Arg Lys Gly Gly Gly Tyr  
420 425 430

Tyr Ser Thr Val Asn Phe Thr Leu Ile Glu Tyr Asp Pro Ala Ile Phe  
435 440 445

Ile Leu Lys Leu Asn Lys Val Ile Arg Leu Tyr Lys Ala Thr Gly Met  
450 455 460

Thr Thr Ala Glu Ile Tyr Gln Ile Thr Asn Ile Leu Asn Asn Gly Leu  
465 470 475 480

Thr Ile Asp His Ala Val Leu Ser Lys Ile Phe Leu Val Arg Tyr Leu  
485 490 495

Met Arg His Tyr Gln Leu Asp Val Ala Arg Ser Leu Ile Leu Cys Asn  
500 505 510

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Gly Thr Ile Ser Asp Gln Ala Phe Ser Gly Glu Thr Gly Leu Phe Thr  
515 520 525

Thr Leu Phe Asn Thr Pro Pro Leu Asn Gly Gln Leu Phe Ser Ala Asp  
530 535 540

Asp Thr Pro Leu Asp Leu Arg Ser Glu Ala Pro Glu Asp Ala Phe Arg  
545 550 555 560

Leu Ser Val Leu Lys Arg Ala Phe Asn Ile Ser Ala Ser Gly Leu Ser  
565 570 575

Thr Leu Trp Gln Leu Ala Ser Gly Asp Ser Ser Ala Gly Phe Ser Cys  
580 585 590

Ser Ala Asp Asn Ile Ala Ala Leu Tyr Arg Val Lys Leu Leu Ala Asp  
595 600 605

Ile His Asp Leu Ser Ala Gly Glu Leu Ser Met Leu Leu Ser Val Ser  
610 615 620

Pro Phe Ser Gly Val Ala Ala Gly Ser Leu Ser Asp Asn Glu Leu Thr  
625 630 635 640

Gln Phe Leu Tyr Gln Thr Thr Thr Trp Leu Thr Glu Gln Gly Trp Thr  
645 650 655

Val Ser Asp Val Phe Leu Met Leu Thr Thr Gln Tyr Gly Thr Leu Leu  
660 665 670

Thr Pro Asp Ile Glu Asn Leu Leu Ala Ser Leu Arg Asn Gly Leu Ser  
675 680 685

Gly Arg Glu Leu Phe Pro Glu Thr Leu Pro Gly Asp Gly Ala Pro Phe  
690 695 700

Ile Ala Ala Ala Met Gln Leu Asp Ala Thr Asp Thr Ala Lys Ala Met  
705 710 715 720

Leu Thr Trp Ala Asp Gln Leu Lys Pro Glu Gly Leu Thr Leu Thr Glu  
725 730 735

Phe Ile Leu Leu Val Met Asn Ala Ala Pro Asn Asp Glu Gln Ala Gly  
740 745 750

Gln Met Ala Gly Phe Cys Gln Ala Leu Trp Gln Leu Ala Leu Ile Ile

755

760

765

Arg Ser Thr Gly Leu Ser Thr Arg Glu Leu Thr Leu Leu Val Ser Gln  
 770 775 780

Pro Gly Arg Phe Arg Thr Gly Trp His His Leu Pro His Asp Leu Pro  
 785 790 795 800

Ala Leu Arg Asp Ile Thr Arg Phe His Ala Val Val Asn Arg Ser Gly  
 805 810 815

Ser His Ala Gly Glu Val Leu Thr Ala Leu Glu Thr Gly Glu Leu Ser  
 820 825 830

Ser Ala Leu Leu Ala Arg Ala Leu Ser Gln Asn Glu Gln Asp Val Thr  
 835 840 845

Gly Ala Leu Ala Gln Val Arg Gly Ala Gly Glu Gln Asp Asn Ser Val  
 850 855 860

Phe Thr Ser Trp Glu Glu Val Asp Gln Ala Glu Gln Trp Leu Asp Met  
 865 870 875 880

Ser Glu Thr Leu Ser Ile Thr Pro Ser Gly Leu Ala Ser Leu Ile Ala  
 885 890 895

Leu Lys Tyr Ile Asn Val Ser Asp Asp Ser Ala Pro Leu Tyr Ser Gln  
 900 905 910

Trp Gln Val Val Ser Gly Leu Leu Gln Ala Gly Leu Lys Ser Ser Gln  
 915 920 925

Ser Ser Ala Leu His Asp Tyr Leu Glu Glu Gly Thr Ser Ser Ala Leu  
 930 935 940

Cys Ala Tyr Tyr Leu Arg Asn Leu Ala Pro Asn Met Val Ser Gly Arg  
 945 950 955 960

Asp Asp Leu Phe Gly Tyr Leu Leu Leu Asp Asn Gln Val Ser Ala Lys  
 965 970 975

Val Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Gly Ile Arg Leu Tyr  
 980 985 990

Ile Asn Arg Ala Leu Asn Gly Ile Glu Leu Ser Ala Met Ala Glu Val  
 995 1000 1005

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Tyr	Ser	Thr	Trp	Ala	Gly	Val	Ser	Glu	Leu	Val	Tyr	Tyr	Pro	Glu
	1025					1030					1035			
Asn	Tyr	Leu	Asp	Pro	Thr	Val	Arg	Ile	Gly	Gln	Thr	Gly	Met	Met
	1040					1045					1050			
Asp	Thr	Leu	Leu	Gln	Ser	Val	Ser	Gln	Ser	Ser	Ile	Asn	Arg	Asp
	1055					1060					1065			
Thr	Val	Glu	Asp	Ala	Phe	Lys	Thr	Tyr	Leu	Thr	Thr	Phe	Glu	Gln
	1070					1075					1080			
Ile	Ala	Asn	Leu	Asn	Thr	Val	Ser	Gly	Tyr	His	Asp	Asn	Ala	Ser
	1085					1090					1095			
Met	Thr	Gln	Gly	Thr	Thr	Trp	Tyr	Val	Gly	Arg	Ser	Ile	Thr	Asp
	1100					1105					1110			
Gln	Thr	Asn	Trp	Tyr	Trp	Arg	Ser	Ala	Asn	His	Ser	Lys	Ile	Gln
	1115					1120					1125			
Asp	Ser	Met	Met	Pro	Ala	Asn	Ala	Trp	Thr	Gly	Trp	Thr	Lys	Ile
	1130					1135					1140			
Asn	Cys	Gly	Met	Asn	Pro	Trp	Ser	Asp	Leu	Val	Cys	Ser	Val	Phe
	1145					1150					1155			
Phe	Asn	Ser	Arg	Leu	Tyr	Val	Val	Trp	Val	Glu	Glu	Asn	Gln	Ser
	1160					1165					1170			
Ala	Asp	Thr	Glu	Ala	Glu	Ser	Thr	Thr	Thr	Thr	Gln	Gln	Ser	Tyr
	1175					1180					1185			
Thr	Leu	Lys	Leu	Ser	Phe	Arg	Arg	Tyr	Asp	Gly	Thr	Trp	Ser	Ser
	1190					1195					1200			
Pro	Val	Ser	Phe	Asp	Ile	Thr	Gly	Asn	Ile	Ala	Phe	Pro	Glu	Thr
	1205					1210					1215			
Gln	Gly	Met	His	Val	Thr	Cys	Asn	Pro	Leu	Thr	Glu	Gln	Leu	Tyr
	1220					1225					1230			
Cys	Ala	Phe	Tyr	Ser	Val	Thr	Ser	Lys	Pro	Asp	Phe	Asp	Asn	Ala
	1235					1240					1245			

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Gln Leu Ile Ser Val Asp Asn Asp Met Thr Leu Asn Val Ile Ser  
1250 1255 1260

Asp Ile Gly Ile Phe Lys Ser Val Ser His Glu Phe Asn Thr Ser  
1265 1270 1275

Thr Glu Lys Phe Ile Asn Asn Val Phe Ser Asp Pro Ser Ala Asn  
1280 1285 1290

Tyr Phe Val Ser Ala Thr Ser Leu Ile Asp Asp Val Ile His Ser  
1295 1300 1305

Asp Phe Ser Leu Leu Asn Ser Lys Thr Thr Ser Thr Val Phe Thr  
1310 1315 1320

Asn Glu Asp Ser Ser Leu Leu Thr Pro Glu Leu His Ile Thr Ala  
1325 1330 1335

Asn Val Ser Cys Phe Val Ser Thr Ala Gly Ile Ala Thr Gln Ser  
1340 1345 1350

Thr Ile Glu Lys Phe Val Gln Ala Gly Ile Glu Phe Glu Glu Ile  
1355 1360 1365

Asn Phe Tyr Ala Gly Gln Ala Ala Gly Gly Phe Asp Gly Phe Val  
1370 1375 1380

Gly Val Asp Val Ser Asn Ser Lys Val Tyr Gln Val Gly Lys Glu  
1385 1390 1395

Ala Val Gly Val Thr Val Lys Ser Tyr Ser Val Thr Gly Val Ser  
1400 1405 1410

Gly Ser Val Glu Leu Phe Ile Asp Ser Ser Asn Lys Tyr Phe Ser  
1415 1420 1425

Gly Ile Leu Ser Asp Lys Met Ile Thr Ala Leu Ile Ser Gly Ser  
1430 1435 1440

Thr Ser Lys Val Asn Tyr Val Ser Ser Ile Gly Ser Gln Asp Phe  
1445 1450 1455

Trp Ser Val Lys Ser Leu Met Pro Ala Leu Gln Ile Tyr Glu Leu  
1460 1465 1470

Ile Asp Asp Ile Ile Leu Thr Ser Gly Val Asn Gly Thr Glu Ile  
1475 1480 1485

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Lys Ser Trp Pro Ser Ala Glu Trp Tyr Asn Asp Lys Leu Ser Leu  
 1490 1495 1500  
 Gln Ser Gly Asn Asn Leu Phe Asn Thr Lys Ser Leu Ser Phe Thr  
 1505 1510 1515  
 Val Asn Thr Ser Asp Ile Val Glu Asp Glu Phe Asp Val Thr Phe  
 1520 1525 1530  
 Thr Phe Thr Ala Val Asp Gln Asn Asn Val Val Leu Ala Ala Arg  
 1535 1540 1545  
 Thr Ala Ile Leu Thr Val Ile Arg Asn Ile Asn Asn Asp Thr Ser  
 1550 1555 1560  
 Val Ile Ala Leu Arg Lys Asn Thr Arg Gly Ala Gln Tyr Ile Arg  
 1565 1570 1575  
 Phe Thr Ala Gly Asn Asp Val Ala Leu Ile Arg Leu Asn Thr Leu  
 1580 1585 1590  
 Phe Ala Arg Gln Leu Val Asp Arg Ala Asn Thr Gly Ile Asp Thr  
 1595 1600 1605  
 Ile Leu Ser Met Glu Thr Gln Arg Leu Thr Glu Pro Ala Leu Glu  
 1610 1615 1620  
 Glu Gly Ser Asp Val Phe Met Asp Phe Ser Gly Ala Asn Ala Leu  
 1625 1630 1635  
 Tyr Phe Trp Glu Leu Phe Tyr Tyr Thr Pro Met Met Val Phe Gln  
 1640 1645 1650  
 Arg Leu Leu Gln Glu Gln His Phe Pro Glu Ala Thr Arg Trp Leu  
 1655 1660 1665  
 Gln Tyr Val Trp Asn Pro Ala Gly His Val Val Asn Gly Val Leu  
 1670 1675 1680  
 Gln Asn Tyr Thr Trp Asn Val Arg Pro Leu Glu Glu Asp Thr Gly  
 1685 1690 1695  
 Trp Asn Asp Ser Pro Leu Asp Ser Ile Asp Pro Asp Ala Ile Ala  
 1700 1705 1710  
 Gln Tyr Asp Pro Met His Tyr Lys Val Ala Thr Phe Met Ser Tyr

1715

1720

1725

Leu Asp Leu Leu Ile Ala Arg Gly Asp Ala Ala Tyr Arg Leu Leu  
 1730 1735 1740

Glu Arg Asp Thr Leu Asn Glu Ala Arg Met Trp Tyr Val Gln Ala  
 1745 1750 1755

Leu Asn Leu Leu Gly Asp Glu Pro Tyr Ile Ser Phe Asp Ala Asp  
 1760 1765 1770

Trp Ser Ala Leu Thr Leu Gly Asp Ala Ala Ser Glu Val Thr Arg  
 1775 1780 1785

Arg Asp Tyr Gln Glu Ala Leu Leu Ala Val Arg Arg Leu Val Pro  
 1790 1795 1800

Ala Pro Glu Thr Arg Thr Ala Asn Ser Leu Thr Ala Leu Phe Leu  
 1805 1810 1815

Pro Gln Gln Asn Glu Val Leu Lys Gly Tyr Trp Gln Thr Leu Ala  
 1820 1825 1830

Gln Arg Leu His Asn Leu Arg His Asn Leu Ser Ile Asp Gly Gln  
 1835 1840 1845

Pro Leu Ser Leu Ser Val Tyr Ala Thr Pro Ser Glu Pro Ser Ala  
 1850 1855 1860

Leu Gln Ser Ala Val Val Asn Ser Ala Gln Gly Ala Ala Ala Leu  
 1865 1870 1875

Pro Ala Ala Val Met Pro Leu Tyr Ser Phe Pro Val Met Leu Glu  
 1880 1885 1890

Asn Ala Arg Gly Met Val Ser Leu Leu Thr Gly Phe Gly Asn Thr  
 1895 1900 1905

Leu Leu Gly Ile Thr Glu Arg Gln Asp Ala Glu Ala Leu Ala Lys  
 1910 1915 1920

Leu Leu Gln Thr Gln Gly Ser Glu Leu Ile Arg Gln Gly Leu Arg  
 1925 1930 1935

Gln Gln Asp Asn Val Leu Glu Glu Ile Asp Ala Asp Ile Ala Ala  
 1940 1945 1950

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Leu Glu Glu Ser Arg Arg Gly Ala Gln Met Arg Phe Glu Arg Tyr  
1955 1960 1965

Lys Val Leu Tyr Glu Ala Asp Val Asn Thr Gly Glu Lys Gln Ala  
1970 1975 1980

Met Asp Leu Tyr Leu Ser Ser Ser Val Leu Ser Ala Ser Thr Ala  
1985 1990 1995

Ala Leu Phe Leu Ala Glu Ala Ala Ala Asp Met Leu Pro Asn Ile  
2000 2005 2010

Tyr Gly Leu Ala Val Gly Gly Ser Arg Tyr Gly Ala Leu Phe Lys  
2015 2020 2025

Ala Thr Ala Ile Gly Ile Gln Val Ser Ser Asp Ala Thr Arg Ile  
2030 2035 2040

Ser Ala Asp Lys Ile Ser Gln Ser Glu Val Tyr Arg Arg Arg Arg  
2045 2050 2055

Glu Glu Trp Glu Ile Gln Arg Asp Ser Ala Gln Ser Asp Val Ala  
2060 2065 2070

Gln Ile Asp Ala Gln Leu Ala Ala Met Ala Val Arg Arg Glu Gly  
2075 2080 2085

Ala Glu Leu Gln Lys Thr Tyr Leu Glu Thr Gln Gln Thr Gln Ala  
2090 2095 2100

Gln Ala Gln Leu Ala Phe Leu Gln Ser Lys Phe Asn Asn Thr Ala  
2105 2110 2115

Leu Tyr Ser Trp Leu Arg Gly Arg Leu Ser Ala Ile Tyr Tyr Gln  
2120 2125 2130

Phe Tyr Asp Leu Ala Val Ser Arg Cys Leu Met Ala Gln Gln Ala  
2135 2140 2145

Trp Gln Trp Asp Lys Phe Glu Thr Arg Ser Phe Ile Gln Pro Gly  
2150 2155 2160

Ala Trp Met Gly Ala Asn Ala Gly Leu Leu Ala Gly Glu Thr Leu  
2165 2170 2175

Met Leu Asn Leu Ala Gln Met Glu Gln Ala Trp Leu Thr Gly Asp  
2180 2185 2190

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Glu Arg Ala Ile Glu Val Thr Arg Thr Val Cys Leu Ser Glu Val  
2195 2200 2205

Tyr Thr Ser Leu Ala Glu Asp Ala Ala Phe Ser Leu Ala Asp Lys  
2210 2215 2220

Val Val Glu Leu Val Ser Asn Gly Ser Gly Ser Ala Gly Thr Lys  
2225 2230 2235

Ser Asn Gly Leu Gln Met Asp Gln Gln Gln Leu Glu Ala Thr Leu  
2240 2245 2250

Lys Leu Ala Asp Leu Gly Ile Gly Asn Asp Tyr Pro Val Ser Leu  
2255 2260 2265

Gly Thr Met Arg Arg Ile Lys Gln Ile Ser Val Thr Leu Pro Ala  
2270 2275 2280

Leu Val Gly Pro Tyr Gln Asp Val Arg Ala Val Leu Ser Tyr Gly  
2285 2290 2295

Gly Ser Met Val Met Pro Arg Gly Cys Ser Ala Leu Ala Val Ser  
2300 2305 2310

His Gly Met Asn Asp Ser Gly Gln Phe Gln Leu Asp Phe Asn Asp  
2315 2320 2325

Pro Arg Tyr Leu Pro Phe Glu Gly Leu Pro Val Asp Asp Thr Gly  
2330 2335 2340

Thr Leu Thr Leu Ser Phe Pro Asp Ala Asp Gly Lys Gln Gln Ala  
2345 2350 2355

Met Leu Leu Ser Leu Ser Asp Ile Ile Leu His Ile Arg Tyr Thr  
2360 2365 2370

Ile Ile Ser  
2375

<210> 5  
<211> 1428  
<212> PRT  
<213> Serratia entomophila

<400> 5

Met Gln Asn His Gln Asp Met Ala Ile Thr Ala Pro Thr Leu Pro Ser  
1 5 10 15

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Gly Gly Gly Ala Val Thr Gly Leu Lys Gly Asp Ile Ala Ala Ala Gly  
20 25 30

Pro Asp Gly Ala Ala Thr Leu Ser Ile Pro Leu Pro Val Ser Pro Gly  
35 40 45

Arg Gly Tyr Ala Pro Thr Gly Ala Leu Asn Tyr His Ser Arg Ser Gly  
50 55 60

Asn Gly Pro Phe Gly Ile Gly Trp Gly Ile Gly Gly Ala Ala Val Gln  
65 70 75 80

Arg Arg Thr Arg Asn Gly Ala Pro Thr Tyr Asp Asp Thr Asp Glu Phe  
85 90 95

Thr Gly Pro Asp Gly Glu Val Leu Val Pro Ala Leu Thr Ala Ala Gly  
100 105 110

Thr Gln Glu Ala Arg Gln Ala Thr Ser Leu Leu Gly Ile Asn Pro Gly  
115 120 125

Gly Ser Phe Asn Val Gln Val Tyr Arg Ser Arg Thr Glu Gly Ser Leu  
130 135 140

Ser Arg Leu Glu Arg Trp Leu Pro Ala Asp Glu Thr Glu Thr Glu Phe  
145 150 155 160

Trp Val Leu Tyr Thr Pro Asp Gly Gln Val Ala Leu Leu Gly Arg Asn  
165 170 175

Ala Gln Ala Arg Ile Ser Asn Pro Thr Ala Pro Thr Gln Thr Ala Val  
180 185 190

Trp Leu Met Glu Ser Ser Val Ser Leu Thr Gly Glu Gln Met Tyr Tyr  
195 200 205

Gln Tyr Arg Ala Glu Asp Asp Asp Gly Cys Asp Glu Ala Glu Arg Asp  
210 215 220

Ala His Pro Gln Ala Gly Ala Gln Arg Tyr Pro Val Ala Val Trp Tyr  
225 230 235 240

Gly Asn Arg Gln Ala Ala Arg Thr Leu Pro Ala Leu Val Ser Thr Pro  
245 250 255

Ser Met Asp Ser Trp Leu Phe Ile Leu Val Phe Asp Tyr Gly Glu Arg  
260 265 270

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Ser Ser Val Leu Ser Glu Ala Pro Ala Trp Gln Thr Pro Gly Ser Gly  
275 280 285

Glu Trp Leu Cys Arg Gln Asp Cys Phe Ser Gly Tyr Glu Phe Gly Phe  
290 295 300

Asn Leu Arg Thr Arg Arg Leu Cys Arg Gln Val Leu Met Phe His Tyr  
305 310 315 320

Leu Gly Val Leu Ala Gly Ser Ser Gly Ala Asn Asp Ala Pro Ala Leu  
325 330 335

Ile Ser Arg Leu Leu Leu Asp Tyr Arg Glu Ser Pro Ser Leu Ser Leu  
340 345 350

Leu Glu Asn Val His Gln Val Ala Tyr Glu Ser Asp Gly Thr Ser Cys  
355 360 365

Ala Leu Pro Ala Leu Ala Leu Gly Trp Gln Thr Phe Thr Pro Pro Thr  
370 375 380

Leu Ser Ala Trp Gln Thr Arg Asp Asp Met Gly Lys Leu Ser Leu Leu  
385 390 395 400

Gln Pro Tyr Gln Leu Val Asp Leu Asn Gly Glu Gly Val Val Gly Ile  
405 410 415

Leu Tyr Gln Asp Ser Gly Ala Trp Trp Tyr Arg Glu Pro Val Arg Gln  
420 425 430

Ser Gly Asp Asp Pro Asp Ala Val Thr Trp Gly Ala Ala Ala Ala Leu  
435 440 445

Pro Thr Met Pro Ala Leu His Asn Ser Gly Ile Leu Ala Asp Leu Asn  
450 455 460

Gly Asp Gly Arg Leu Glu Trp Val Val Thr Ala Pro Gly Val Ala Gly  
465 470 475 480

Met Tyr Asp Arg Thr Pro Gly Arg Asp Trp Leu His Phe Thr Pro Leu  
485 490 495

Ser Ala Leu Pro Val Glu Tyr Ala His Pro Lys Ala Val Leu Ala Asp  
500 505 510

Ile Leu Gly Ala Gly Leu Thr Asp Met Val Leu Ile Gly Pro Arg Ser

515

520

525

Val Arg Leu Tyr Ser Gly Lys Asn Asp Gly Trp Asn Lys Gly Glu Thr  
 530 535 540

Val Gln Gln Thr Glu Arg Leu Thr Leu Pro Val Pro Gly Val Asp Pro  
 545 550 555 560

Arg Thr Leu Val Ala Phe Ser Asp Met Ala Gly Ser Gly Gln Gln His  
 565 570 575

Leu Thr Glu Val Arg Ala Asn Gly Val Arg Tyr Trp Pro Asn Leu Gly  
 580 585 590

His Gly Arg Phe Gly Gln Pro Val Asn Ile Pro Gly Phe Ser Gln Ser  
 595 600 605

Val Thr Thr Phe Asn Pro Asp Gln Ile Leu Leu Ala Asp Thr Asp Gly  
 610 615 620

Ser Gly Thr Thr Asp Leu Ile Tyr Ala Met Ser Asp Arg Leu Val Ile  
 625 630 635 640

Tyr Phe Asn Gln Ser Gly Asn Tyr Phe Ala Glu Pro His Thr Leu Leu  
 645 650 655

Leu Pro Lys Gly Val Arg Tyr Asp Arg Thr Cys Ser Leu Gln Val Ala  
 660 665 670

Asp Ile Gln Gly Leu Gly Val Pro Ser Leu Leu Leu Thr Val Pro His  
 675 680 685

Val Ala Pro His His Trp Val Cys His Leu Ser Ala Asp Lys Pro Trp  
 690 695 700

Leu Leu Asn Gly Met Asn Asn Asn Met Gly Ala Arg His Ala Leu His  
 705 710 715 720

Tyr Arg Ser Ser Val Gln Phe Trp Leu Asp Glu Lys Ala Glu Ala Leu  
 725 730 735

Ala Ala Gly Ser Ser Pro Ala Cys Tyr Leu Pro Phe Thr Leu His Thr  
 740 745 750

Leu Trp Arg Ser Val Val Gln Asp Glu Ile Thr Gly Asn Arg Leu Val  
 755 760 765

Ser Asp Val Leu Tyr Arg His Gly Val Trp Asp Gly Gln Glu Arg Glu  
 770 775 780

Phe Arg Gly Phe Gly Phe Val Glu Ile Arg Asp Thr Asp Thr Leu Ala  
 785 790 795 800

Ser Gln Gly Thr Ala Thr Glu Leu Ser Met Pro Ser Val Ser Arg Asn  
 805 810 815

Trp Tyr Ala Thr Gly Val Pro Ala Val Asp Glu Arg Leu Pro Glu Thr  
 820 825 830

Tyr Trp Gln Asn Asp Ala Ala Ala Phe Ala Asp Phe Ala Thr Arg Phe  
 835 840 845

Thr Val Gly Ser Gly Glu Asp Glu Gln Thr Tyr Thr Pro Asp Asp Ser  
 850 855 860

Lys Thr Phe Trp Leu Gln Arg Ala Leu Lys Gly Ile Leu Leu Arg Ser  
 865 870 875 880

Glu Leu Tyr Gly Ala Asp Gly Ser Ser Gln Ala Asp Ile Pro Tyr Ser  
 885 890 895

Val Thr Glu Ser Arg Pro Gln Val Arg Leu Val Glu Ala Asn Gly Asp  
 900 905 910

Tyr Pro Val Val Trp Pro Met Gly Ala Glu Ser Arg Thr Ser Val Tyr  
 915 920 925

Glu Arg Tyr His Asn Asp Pro Gln Cys Gln Gln Gln Ala Val Leu Leu  
 930 935 940

Ser Asp Glu Tyr Gly Phe Pro Leu Arg Gln Val Ser Val Asn Tyr Pro  
 945 950 955 960

Arg Arg Pro Pro Ser Ala Asp Asn Pro Tyr Pro Ala Ser Leu Pro Ala  
 965 970 975

Thr Leu Phe Ala Asn Ser Tyr Asp Glu Gln Gln Gln Ile Leu Arg Leu  
 980 985 990

Gly Leu Gln Gln Ser Ser Ala His His Leu Val Ser Leu Ser Glu Gly  
 995 1000 1005

His Trp Leu Leu Gly Leu Ala Glu Ala Ser Arg Asp Asp Val Phe  
 1010 1015 1020

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Thr	Tyr 1025	Ser	Ala	Asp	Asn	Val 1030	Pro	Glu	Gly	Gly	Leu 1035	Thr	Leu	Glu
His	Leu 1040	Leu	Ala	Pro	Glu	Ser 1045	Leu	Val	Ser	Asp	Ser 1050	Gln	Val	Gly
Thr	Leu 1055	Ala	Gly	Gln	Gln	Gln 1060	Val	Trp	Tyr	Leu	Asp 1065	Ser	Gln	Asp
Val	Ala 1070	Thr	Val	Ala	Ala	Pro 1075	Pro	Leu	Pro	Pro	Lys 1080	Val	Ala	Phe
Ile	Glu 1085	Thr	Ala	Val	Leu	Asp 1090	Glu	Gly	Met	Val	Ser 1095	Ser	Leu	Ala
Ala	Tyr 1100	Ile	Val	Asp	Glu	His 1105	Leu	Glu	Gln	Ala	Gly 1110	Tyr	Arg	Gln
Ser	Gly 1115	Tyr	Leu	Phe	Pro	Arg 1120	Gly	Arg	Glu	Ala	Glu 1125	Gln	Ala	Leu
Trp	Thr 1130	Gln	Cys	Gln	Gly	Tyr 1135	Val	Thr	Tyr	Ala	Gly 1140	Ala	Glu	His
Phe	Trp 1145	Leu	Pro	Leu	Ser	Phe 1150	Arg	Asp	Ser	Met	Leu 1155	Thr	Gly	Pro
Val	Thr 1160	Val	Thr	Arg	Asp	Ala 1165	Tyr	Asp	Cys	Val	Ile 1170	Thr	Gln	Trp
Gln	Asp 1175	Ala	Ala	Gly	Ile	Val 1180	Thr	Thr	Ala	Asp	Tyr 1185	Asp	Trp	Arg
Phe	Leu 1190	Thr	Pro	Val	Arg	Val 1195	Thr	Asp	Pro	Asn	Asp 1200	Asn	Leu	Gln
Ser	Val 1205	Thr	Leu	Asp	Ala	Leu 1210	Gly	Arg	Val	Thr	Thr 1215	Leu	Arg	Phe
Trp	Gly 1220	Thr	Glu	Asn	Gly	Ile 1225	Ala	Thr	Gly	Tyr	Ser 1230	Asp	Ala	Thr
Leu	Ser 1235	Val	Pro	Asp	Gly	Ala 1240	Ala	Ala	Ala	Leu	Ala 1245	Leu	Thr	Ala
Pro	Leu 1250	Pro	Val	Ala	Gln	Cys 1255	Leu	Val	Tyr	Val	Thr 1260	Asp	Ser	Trp

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Gly Asp Asp Asp Asn Glu Lys Met Pro Pro His Val Val Val Leu  
1265 1270 1275

Ala Thr Asp Arg Tyr Asp Ser Asp Thr Gly Gln Gln Val Arg Gln  
1280 1285 1290

Gln Val Thr Phe Ser Asp Gly Phe Gly Arg Glu Leu Gln Ser Ala  
1295 1300 1305

Thr Arg Gln Ala Glu Gly Asn Ala Trp Gln Arg Gly Arg Asp Gly  
1310 1315 1320

Lys Leu Val Thr Ala Ser Asp Gly Leu Pro Val Thr Val Ala Thr  
1325 1330 1335

Asn Phe Arg Trp Ala Val Thr Gly Arg Ala Glu Tyr Asp Asn Lys  
1340 1345 1350

Gly Leu Pro Val Arg Val Tyr Gln Pro Tyr Phe Leu Asp Ser Trp  
1355 1360 1365

Gln Tyr Val Ser Asp Asp Ser Ala Arg Gln Asp Leu Tyr Ala Asp  
1370 1375 1380

Thr His Phe Tyr Asp Pro Thr Ala Arg Glu Trp Gln Val Ile Thr  
1385 1390 1395

Ala Lys Gly Glu Arg Arg Gln Val Leu Tyr Thr Pro Trp Phe Val  
1400 1405 1410

Val Ser Glu Asp Glu Asn Asp Thr Val Gly Leu Asn Asp Ala Ser  
1415 1420 1425

<210> 6  
<211> 973  
<212> PRT  
<213> Serratia entomophila

<400> 6

Met Ser Thr Ser Leu Phe Ser Ser Thr Pro Ser Val Ala Val Leu Asp  
1 5 10 15

Asn Arg Gly Leu Leu Val Arg Glu Leu Gln Tyr Tyr Arg His Pro Asp  
20 25 30

Thr Pro Glu Glu Thr Asp Glu Arg Ile Thr Cys His Gln His Asp Glu  
35 40 45

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Arg Gly Ser Leu Ser Gln Ser Ala Asp Pro Arg Leu His Ala Ala Gly  
50 55 60

Leu Thr Asn Phe Thr Tyr Leu Asn Ser Leu Thr Gly Thr Val Leu Gln  
65 70 75 80

Ser Val Ser Ala Asp Ala Gly Thr Ser Leu Glu Leu Ser Asp Ala Ala  
85 90 95

Gly Arg Ala Phe Leu Ala Val Thr Gly Ala Gly Thr Glu Asp Ala Val  
100 105 110

Thr Arg Thr Trp Gln Tyr Glu Asp Asp Thr Leu Pro Gly Arg Pro Leu  
115 120 125

Ser Ile Thr Glu Gln Val Thr Gly Glu Ala Ala Gln Ile Thr Glu Arg  
130 135 140

Phe Val Tyr Ala Gly Asn Thr Asp Ala Glu Lys Ile Leu Asn Leu Ala  
145 150 155 160

Gly Gln Cys Val Ser His Tyr Asp Thr Ala Gly Leu Val Gln Thr Asp  
165 170 175

Ser Ile Ala Leu Ser Gly Val Pro Leu Ala Val Thr Arg Gln Leu Leu  
180 185 190

Pro Asp Ala Ala Gly Ala Asn Trp Met Gly Glu Asp Ala Ser Ala Trp  
195 200 205

Asn Asp Leu Leu Asp Gly Glu Thr Phe Phe Thr Gln Thr His Ala Asp  
210 215 220

Ala Thr Gly Ala Val Leu Ser Ile Thr Asp Ala Lys Gly Asn Leu Gln  
225 230 235 240

Arg Val Ala Tyr Asp Val Ala Gly Leu Leu Ser Gly Ser Trp Leu Thr  
245 250 255

Leu Lys Asp Gly Thr Glu Gln Val Ile Val Ala Ser Leu Thr Tyr Ser  
260 265 270

Ala Ala Gly Lys Lys Leu Arg Glu Glu His Gly Asn Gly Val Val Thr  
275 280 285

Ser Tyr Ile Tyr Glu Pro Glu Thr Gln Arg Leu Thr Gly Ile Lys Thr

290

295

300

Glu Arg Pro Ser Gly His Val Ala Gly Ala Lys Val Leu Gln Asp Leu  
305 310 315 320

Arg Tyr Thr Tyr Asp Pro Val Gly Asn Val Leu Ser Val Asn Asn Asp  
325 330 335

Ala Glu Glu Thr Arg Phe Trp Arg Asn Gln Lys Val Val Pro Glu Asn  
340 345 350

Thr Tyr Ile Tyr Asp Ser Leu Tyr Gln Leu Val Ser Ala Thr Gly Arg  
355 360 365

Glu Met Ala Asn Ala Gly Gln Gln Gly Asn Asp Leu Pro Ser Ala Thr  
370 375 380

Ala Pro Leu Pro Thr Asp Ser Ser Ala Tyr Thr Asn Tyr Thr Arg Thr  
385 390 395 400

Tyr Arg Tyr Asp Arg Gly Gly Asn Leu Thr Gln Met Arg His Ser Ala  
405 410 415

Pro Ala Thr Asn Asn Asn Tyr Thr Thr Asp Ile Thr Val Ser Asp Arg  
420 425 430

Ser Asn Arg Ala Val Leu Ser Thr Leu Ala Glu Val Pro Ser Asp Val  
435 440 445

Asp Met Leu Phe Ser Ala Gly Gly His Gln Lys His Leu Gln Pro Gly  
450 455 460

Gln Ala Leu Val Trp Thr Pro Arg Gly Glu Leu Gln Lys Val Thr Pro  
465 470 475 480

Val Val Arg Asp Gly Gly Ala Asp Asp Ser Glu Ser Tyr Arg Tyr Asp  
485 490 495

Ala Gly Ser Gln Arg Ile Ile Lys Thr Gly Thr Arg Gln Thr Gly Asn  
500 505 510

Asn Val Gln Thr Gln Arg Val Val Tyr Leu Pro Gly Leu Glu Leu Arg  
515 520 525

Ile Met Ala Asn Gly Val Thr Glu Lys Glu Ser Leu Gln Val Ile Thr  
530 535 540

Val Gly Glu Ala Gly Arg Ala Gln Val Arg Val Leu His Trp Glu Ile  
 545 550 555 560  
 Gly Lys Pro Asp Asp Leu Asp Glu Asp Ser Val Arg Tyr Ser Tyr Asp  
 565 570 575  
 Asn Leu Val Gly Ser Ser Gln Leu Glu Leu Asp Arg Glu Gly Tyr Leu  
 580 585 590  
 Ile Ser Glu Glu Glu Phe Tyr Pro Tyr Gly Gly Thr Ala Val Leu Thr  
 595 600 605  
 Ala Arg Ser Glu Val Glu Ala Asp Tyr Lys Thr Ile Arg Tyr Ser Gly  
 610 615 620  
 Lys Glu Arg Asp Ala Thr Gly Leu Asp Tyr Tyr Gly Tyr Arg Tyr Tyr  
 625 630 635 640  
 Gln Pro Trp Ala Gly Arg Trp Leu Ser Thr Asp Pro Ala Gly Thr Val  
 645 650 655  
 Asp Gly Leu Asn Leu Phe Arg Met Val Arg Asn Asn Pro Val Thr Leu  
 660 665 670  
 Phe Asp Ser Asn Gly Arg Ile Ser Thr Gly Gln Glu Ala Arg Arg Leu  
 675 680 685  
 Val Gly Glu Ala Phe Val His Pro Leu His Met Pro Val Phe Glu Arg  
 690 695 700  
 Ile Ser Val Glu Arg Lys Ile Ser Met Ser Val Arg Glu Ala Gly Ile  
 705 710 715 720  
 Tyr Thr Ile Ser Ala Leu Gly Glu Gly Ala Ala Ala Lys Gly His Asn  
 725 730 735  
 Ile Leu Glu Lys Thr Ile Lys Pro Gly Ser Leu Lys Ala Ile Tyr Gly  
 740 745 750  
 Asp Lys Ala Glu Ser Ile Leu Gly Leu Ala Lys Arg Ser Gly Leu Val  
 755 760 765  
 Gly Arg Val Gly Gln Trp Asp Ala Ser Gly Val Arg Gly Ile Tyr Ala  
 770 775 780  
 His Asn Arg Pro Gly Gly Glu Asp Leu Val Tyr Pro Val Ser Leu Gln  
 785 790 795 800

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Asn Thr Ser Ala Asn Glu Ile Val Asn Ala Trp Ile Lys Phe Lys Ile  
805 810 815

Ile Thr Pro Tyr Thr Gly Asp Tyr Asp Met His Asp Ile Ile Lys Phe  
820 825 830

Ser Asp Gly Lys Gly His Val Pro Thr Ala Glu Ser Ser Glu Glu Arg  
835 840 845

Gly Val Lys Asp Leu Ile Asn Lys Gly Val Ala Glu Val Asp Pro Ser  
850 855 860

Arg Pro Phe Glu Tyr Thr Ala Met Asn Val Ile Arg His Gly Pro Gln  
865 870 875 880

Val Asn Phe Val Pro Tyr Met Trp Glu His Glu His Asp Lys Val Val  
885 890 895

Asn Asp Asn Gly Tyr Leu Gly Val Val Ala Ser Pro Gly Pro Phe Pro  
900 905 910

Val Ala Met Val His Gln Gly Glu Trp Thr Val Phe Asp Asn Ser Glu  
915 920 925

Glu Leu Phe Asn Phe Tyr Lys Ser Thr Asn Thr Pro Leu Pro Glu His  
930 935 940

Trp Ser Gln Asp Phe Met Asp Arg Gly Lys Gly Ile Val Ala Thr Pro  
945 950 955 960

Arg His Ala Glu Leu Leu Asp Lys Arg Arg Val Met Tyr  
965 970

<210> 7  
<211> 2516  
<212> PRT  
<213> Photorhabdus luminescens,  
<400> 7

Met Asn Glu Ser Val Lys Glu Ile Pro Asp Val Leu Lys Ser Gln Cys  
1 5 10 15

Gly Phe Asn Cys Leu Thr Asp Ile Ser His Ser Ser Phe Asn Glu Phe  
20 25 30

Arg Gln Gln Val Ser Glu His Leu Ser Trp Ser Glu Thr His Asp Leu  
35 40 45

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Tyr His Asp Ala Gln Gln Ala Gln Lys Asp Asn Arg Leu Tyr Glu Ala  
 50 55 60  
 Arg Ile Leu Lys Arg Ala Asn Pro Gln Leu Gln Asn Ala Val His Leu  
 65 70 75 80  
 Ala Ile Leu Ala Pro Asn Ala Glu Leu Ile Gly Tyr Asn Asn Gln Phe  
 85 90 95  
 Ser Gly Arg Ala Ser Gln Tyr Val Ala Pro Gly Thr Val Ser Ser Met  
 100 105 110  
 Phe Ser Pro Ala Ala Tyr Leu Thr Glu Leu Tyr Arg Glu Ala Arg Asn  
 115 120 125  
 Leu His Ala Ser Asp Ser Val Tyr Tyr Leu Asp Thr Arg Arg Pro Asp  
 130 135 140  
 Leu Lys Ser Met Ala Leu Ser Gln Gln Asn Met Asp Ile Glu Leu Ser  
 145 150 155 160  
 Thr Leu Ser Leu Ser Asn Glu Leu Leu Leu Glu Ser Ile Lys Thr Glu  
 165 170 175  
 Ser Lys Leu Glu Asn Tyr Thr Lys Val Met Glu Met Leu Ser Thr Phe  
 180 185 190  
 Arg Pro Ser Gly Ala Thr Pro Tyr His Asp Ala Tyr Glu Asn Val Arg  
 195 200 205  
 Glu Val Ile Gln Leu Gln Asp Pro Gly Leu Glu Gln Leu Asn Ala Ser  
 210 215 220  
 Pro Ala Ile Ala Gly Leu Met His Gln Ala Ser Leu Leu Gly Ile Asn  
 225 230 235 240  
 Ala Ser Ile Ser Pro Glu Leu Phe Asn Ile Leu Thr Glu Glu Ile Thr  
 245 250 255  
 Glu Gly Asn Ala Glu Glu Leu Tyr Lys Lys Asn Phe Gly Asn Ile Glu  
 260 265 270  
 Pro Ala Ser Leu Ala Met Pro Glu Tyr Leu Lys Arg Tyr Tyr Asn Leu  
 275 280 285  
 Ser Asp Glu Glu Leu Ser Gln Phe Ile Gly Lys Ala Ser Asn Phe Gly  
 290 295 300

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Gln Gln Glu Tyr Ser Asn Asn Gln Leu Ile Thr Pro Val Val Asn Ser  
305 310 315 320

Ser Asp Gly Thr Val Lys Val Tyr Arg Ile Thr Arg Glu Tyr Thr Thr  
325 330 335

Asn Ala Tyr Gln Met Asp Val Glu Leu Phe Pro Phe Gly Gly Glu Asn  
340 345 350

Tyr Arg Leu Asp Tyr Lys Phe Lys Asn Phe Tyr Asn Ala Ser Tyr Leu  
355 360 365

Ser Ile Lys Leu Asn Asp Lys Arg Glu Leu Val Arg Thr Glu Gly Ala  
370 375 380

Pro Gln Val Asn Ile Glu Tyr Ser Ala Asn Ile Thr Leu Asn Thr Ala  
385 390 395 400

Asp Ile Ser Gln Pro Phe Glu Ile Gly Leu Thr Arg Val Leu Pro Ser  
405 410 415

Gly Ser Trp Ala Tyr Ala Ala Ala Lys Phe Thr Val Glu Glu Tyr Asn  
420 425 430

Gln Tyr Ser Phe Leu Leu Lys Leu Asn Lys Ala Ile Arg Leu Ser Arg  
435 440 445

Ala Thr Glu Leu Ser Pro Thr Ile Leu Glu Gly Ile Val Arg Ser Val  
450 455 460

Asn Leu Gln Leu Asp Ile Asn Thr Asp Val Leu Gly Lys Val Phe Leu  
465 470 475 480

Thr Lys Tyr Tyr Met Gln Arg Tyr Ala Ile His Ala Glu Thr Ala Leu  
485 490 495

Ile Leu Cys Asn Ala Pro Ile Ser Gln Arg Ser Tyr Asp Asn Gln Pro  
500 505 510

Ser Gln Phe Asp Arg Leu Phe Asn Thr Pro Leu Leu Asn Gly Gln Tyr  
515 520 525

Phe Ser Thr Gly Asp Glu Glu Ile Asp Leu Asn Ser Gly Ser Thr Gly  
530 535 540

Asp Trp Arg Lys Thr Ile Leu Lys Arg Ala Phe Asn Ile Asp Asp Val  
Page 34

545

550

555

560

Ser Leu Phe Arg Leu<sub>565</sub> Leu Lys Ile Thr Asp<sub>570</sub> His Asp Asn Lys Asp<sub>575</sub> Gly

Lys Ile Lys Asn<sub>580</sub> Asn Leu Lys Asn<sub>585</sub> Leu Ser Asn Leu Tyr Ile<sub>590</sub> Gly Lys

Leu Leu Ala<sub>595</sub> Asp Ile His Gln<sub>600</sub> Leu Thr Ile Asp Glu<sub>605</sub> Leu Asp Leu Leu

Leu Ile Ala Val Gly Glu Gly<sub>615</sub> Lys Thr Asn Leu Ser<sub>620</sub> Ala Ile Ser Asp

Lys Gln Leu Ala Thr Leu<sub>630</sub> Ile Arg Lys Leu Asn<sub>635</sub> Thr Ile Thr Ser Trp<sub>640</sub>

Leu His Thr Gln Lys<sub>645</sub> Trp Ser Val Phe Gln<sub>650</sub> Leu Phe Ile Met Thr Ser<sub>655</sub>

Thr Ser Tyr Asn<sub>660</sub> Lys Thr Leu Thr Pro<sub>665</sub> Glu Ile Lys Asn Leu<sub>670</sub> Leu Asp

Thr Val Tyr<sub>675</sub> His Gly Leu Gln Gly<sub>680</sub> Phe Asp Lys Asp Lys<sub>685</sub> Ala Asp Leu

Leu His Val Met Ala Pro Tyr<sub>695</sub> Ile Ala Ala Thr Leu<sub>700</sub> Gln Leu Ser Ser

Glu Asn Val Ala His Ser<sub>710</sub> Val Leu Leu Trp Ala<sub>715</sub> Asp Lys Leu Gln Pro<sub>720</sub>

Gly Asp Gly Ala Met<sub>725</sub> Thr Ala Glu Lys Phe<sub>730</sub> Trp Asp Trp Leu Asn Thr<sub>735</sub>

Lys Tyr Thr Pro<sub>740</sub> Gly Ser Ser Glu Ala<sub>745</sub> Val Glu Thr Gln Glu<sub>750</sub> His Ile

Val Gln Tyr<sub>755</sub> Cys Gln Ala Leu Ala<sub>760</sub> Gln Leu Glu Met Val<sub>765</sub> Tyr His Ser

Thr Gly Ile Asn Glu Asn Ala<sub>775</sub> Phe Arg Leu Phe Val<sub>780</sub> Thr Lys Pro Glu

Met Phe Gly Ala Ala Thr<sub>790</sub> Gly Ala Ala Pro Ala<sub>795</sub> His Asp Ala Leu Ser<sub>800</sub>

Leu Ile Met Leu Thr Arg Phe Ala Asp Trp Val Asn Ala Leu Gly Glu  
 805 810 815  
  
 Lys Ala Ser Ser Val Leu Ala Ala Phe Glu Ala Asn Ser Leu Thr Ala  
 820 825 830  
  
 Glu Gln Leu Ala Asp Ala Met Asn Leu Asp Ala Asn Leu Leu Leu Gln  
 835 840 845  
  
 Ala Ser Ile Gln Ala Gln Asn His Gln His Leu Pro Pro Val Thr Pro  
 850 855 860  
  
 Glu Asn Ala Phe Ser Cys Trp Thr Ser Ile Asn Thr Ile Leu Gln Trp  
 865 870 875 880  
  
 Val Asn Val Ala Gln Gln Leu Asn Val Ala Pro Gln Gly Val Ser Ala  
 885 890 895  
  
 Leu Val Gly Leu Asp Tyr Ile Gln Ser Met Lys Glu Thr Pro Thr Tyr  
 900 905 910  
  
 Ala Gln Trp Glu Asn Ala Ala Gly Val Leu Thr Ala Gly Leu Asn Ser  
 915 920 925  
  
 Gln Gln Ala Asn Thr Leu His Ala Phe Leu Asp Glu Ser Arg Ser Ala  
 930 935 940  
  
 Ala Leu Ser Thr Tyr Tyr Ile Arg Gln Val Ala Lys Ala Ala Ala Ala  
 945 950 955 960  
  
 Ile Lys Ser Arg Asp Asp Leu Tyr Gln Tyr Leu Leu Ile Asp Asn Gln  
 965 970 975  
  
 Val Ser Ala Ala Ile Lys Thr Thr Arg Ile Ala Glu Ala Ile Ala Ser  
 980 985 990  
  
 Ile Gln Leu Tyr Val Asn Arg Ala Leu Glu Asn Val Glu Glu Asn Ala  
 995 1000 1005  
  
 Asn Ser Gly Val Ile Ser Arg Gln Phe Phe Ile Asp Trp Asp Lys  
 1010 1015 1020  
  
 Tyr Asn Lys Arg Tyr Ser Thr Trp Ala Gly Val Ser Gln Leu Val  
 1025 1030 1035  
  
 Tyr Tyr Pro Glu Asn Tyr Ile Asp Pro Thr Met Arg Ile Gly Gln  
 1040 1045 1050

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Thr	Lys 1055	Met	Met	Asp	Ala	Leu 1060	Leu	Gln	Ser	Val	Ser 1065	Gln	Ser	Gln
Leu	Asn 1070	Ala	Asp	Thr	Val	Glu 1075	Asp	Ala	Phe	Met	Ser 1080	Tyr	Leu	Thr
Ser	Phe 1085	Glu	Gln	Val	Ala	Asn 1090	Leu	Lys	Val	Ile	Ser 1095	Ala	Tyr	His
Asp	Asn 1100	Ile	Asn	Asn	Asp	Gln 1105	Gly	Leu	Thr	Tyr	Phe 1110	Ile	Gly	Leu
Ser	Glu 1115	Thr	Asp	Ala	Gly	Glu 1120	Tyr	Tyr	Trp	Arg	Ser 1125	Val	Asp	His
Ser	Lys 1130	Phe	Asn	Asp	Gly	Lys 1135	Phe	Ala	Ala	Asn	Ala 1140	Trp	Ser	Glu
Trp	His 1145	Lys	Ile	Asp	Cys	Pro 1150	Ile	Asn	Pro	Tyr	Lys 1155	Ser	Thr	Ile
Arg	Pro 1160	Val	Ile	Tyr	Lys	Ser 1165	Arg	Leu	Tyr	Leu	Leu 1170	Trp	Leu	Glu
Gln	Lys 1175	Glu	Ile	Thr	Lys	Gln 1180	Thr	Gly	Asn	Ser	Lys 1185	Asp	Gly	Tyr
Gln	Thr 1190	Glu	Thr	Asp	Tyr	Arg 1195	Tyr	Glu	Leu	Lys	Leu 1200	Ala	His	Ile
Arg	Tyr 1205	Asp	Gly	Thr	Trp	Asn 1210	Thr	Pro	Ile	Thr	Phe 1215	Asp	Val	Asn
Lys	Lys 1220	Ile	Ser	Glu	Leu	Lys 1225	Leu	Glu	Lys	Asn	Arg 1230	Ala	Pro	Gly
Leu	Tyr 1235	Cys	Ala	Gly	Tyr	Gln 1240	Gly	Glu	Asp	Thr	Leu 1245	Leu	Val	Met
Phe	Tyr 1250	Asn	Gln	Gln	Asp	Thr 1255	Leu	Asp	Ser	Tyr	Lys 1260	Asn	Ala	Ser
Met	Gln 1265	Gly	Leu	Tyr	Ile	Phe 1270	Ala	Asp	Met	Ala	Ser 1275	Lys	Asp	Met
Thr	Pro 1280	Glu	Gln	Ser	Asn	Val 1285	Tyr	Arg	Asp	Asn	Ser 1290	Tyr	Gln	Gln

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Phe Asp Thr Asn Asn Val Arg Arg Val Asn Asn Arg Tyr Ala Glu  
 1295 1300 1305  
 Asp Tyr Glu Ile Pro Ser Ser Val Ser Ser Arg Lys Asp Tyr Gly  
 1310 1315 1320  
 Trp Gly Asp Tyr Tyr Leu Ser Met Val Tyr Asn Gly Asp Ile Pro  
 1325 1330 1335  
 Thr Ile Asn Tyr Lys Ala Ala Ser Ser Asp Leu Lys Ile Tyr Ile  
 1340 1345 1350  
 Ser Pro Lys Leu Arg Ile Ile His Asn Gly Tyr Glu Gly Gln Lys  
 1355 1360 1365  
 Arg Asn Gln Cys Asn Leu Met Asn Lys Tyr Gly Lys Leu Gly Asp  
 1370 1375 1380  
 Lys Phe Ile Val Tyr Thr Ser Leu Gly Val Asn Pro Asn Asn Ser  
 1385 1390 1395  
 Ser Asn Lys Leu Met Phe Tyr Pro Val Tyr Gln Tyr Ser Gly Asn  
 1400 1405 1410  
 Thr Ser Gly Leu Asn Gln Gly Arg Leu Leu Phe His Arg Asp Thr  
 1415 1420 1425  
 Thr Tyr Pro Ser Lys Val Glu Ala Trp Ile Pro Gly Ala Lys Arg  
 1430 1435 1440  
 Ser Leu Thr Asn Gln Asn Ala Ala Ile Gly Asp Asp Tyr Ala Thr  
 1445 1450 1455  
 Asp Ser Leu Asn Lys Pro Asp Asp Leu Lys Gln Tyr Ile Phe Met  
 1460 1465 1470  
 Thr Asp Ser Lys Gly Thr Ala Thr Asp Val Ser Gly Pro Val Glu  
 1475 1480 1485  
 Ile Asn Thr Ala Ile Ser Pro Ala Lys Val Gln Ile Ile Val Lys  
 1490 1495 1500  
 Ala Gly Gly Lys Glu Gln Thr Phe Thr Ala Asp Lys Asp Val Ser  
 1505 1510 1515  
 Ile Gln Pro Ser Pro Ser Phe Asp Glu Met Asn Tyr Gln Phe Asn

1520

1525

1530

Ala Leu Glu Ile Asp Gly Ser Gly Leu Asn Phe Ile Asn Asn Ser  
 1535 1540 1545

Ala Ser Ile Asp Val Thr Phe Thr Ala Phe Ala Glu Asp Gly Arg  
 1550 1555 1560

Lys Leu Gly Tyr Glu Ser Phe Ser Ile Pro Val Thr Leu Lys Val  
 1565 1570 1575

Ser Thr Asp Asn Ala Leu Thr Leu His His Asn Glu Asn Gly Ala  
 1580 1585 1590

Gln Tyr Met Gln Trp Gln Ser Tyr Arg Thr Arg Leu Asn Thr Leu  
 1595 1600 1605

Phe Ala Arg Gln Leu Val Ala Arg Ala Thr Thr Gly Ile Asp Thr  
 1610 1615 1620

Ile Leu Ser Met Glu Thr Gln Asn Ile Gln Glu Pro Gln Leu Gly  
 1625 1630 1635

Lys Gly Phe Tyr Ala Thr Phe Val Ile Pro Pro Tyr Asn Leu Ser  
 1640 1645 1650

Thr His Gly Asp Glu Arg Trp Phe Lys Leu Tyr Ile Lys His Val  
 1655 1660 1665

Val Asp Asn Asn Ser His Ile Ile Tyr Ser Gly Gln Leu Thr Asp  
 1670 1675 1680

Thr Asn Ile Asn Ile Thr Leu Phe Ile Pro Leu Asp Asp Val Pro  
 1685 1690 1695

Leu Asn Gln Asp Tyr His Ala Lys Val Tyr Met Thr Phe Lys Lys  
 1700 1705 1710

Ser Pro Ser Asp Gly Thr Trp Trp Gly Pro His Phe Val Arg Asp  
 1715 1720 1725

Asp Lys Gly Ile Val Thr Ile Asn Pro Lys Ser Ile Leu Thr His  
 1730 1735 1740

Phe Glu Ser Val Asn Val Leu Asn Asn Ile Ser Ser Glu Pro Met  
 1745 1750 1755

Asp Phe Ser Gly Ala Asn Ser Leu Tyr Phe Trp Glu Leu Phe Tyr  
 1760 1765 1770  
  
 Tyr Thr Pro Met Leu Val Ala Gln Arg Leu Leu His Glu Gln Asn  
 1775 1780 1785  
  
 Phe Asp Glu Ala Asn Arg Trp Leu Lys Tyr Val Trp Ser Pro Ser  
 1790 1795 1800  
  
 Gly Tyr Ile Val His Gly Gln Ile Gln Asn Tyr Gln Trp Asn Val  
 1805 1810 1815  
  
 Arg Pro Leu Leu Glu Asp Thr Ser Trp Asn Ser Asp Pro Leu Asp  
 1820 1825 1830  
  
 Ser Val Asp Pro Asp Ala Val Ala Gln His Asp Pro Met His Tyr  
 1835 1840 1845  
  
 Lys Val Ser Thr Phe Met Arg Thr Leu Asp Leu Leu Ile Ala Arg  
 1850 1855 1860  
  
 Gly Asp His Ala Tyr Arg Gln Leu Glu Arg Asp Thr Leu Asn Glu  
 1865 1870 1875  
  
 Ala Lys Met Trp Tyr Met Gln Ala Leu His Leu Leu Gly Asp Lys  
 1880 1885 1890  
  
 Pro Tyr Leu Pro Leu Ser Thr Thr Trp Ser Asp Pro Arg Leu Asp  
 1895 1900 1905  
  
 Arg Ala Ala Asp Ile Thr Thr Gln Asn Ala His Asp Ser Ala Ile  
 1910 1915 1920  
  
 Val Ala Leu Arg Gln Asn Ile Pro Thr Pro Ala Pro Leu Ser Leu  
 1925 1930 1935  
  
 Arg Ser Ala Asn Thr Leu Thr Asp Leu Phe Leu Pro Gln Ile Asn  
 1940 1945 1950  
  
 Glu Val Met Met Asn Tyr Trp Gln Thr Leu Ala Gln Arg Val Tyr  
 1955 1960 1965  
  
 Asn Leu Arg His Asn Leu Ser Ile Asp Gly Gln Pro Leu Tyr Leu  
 1970 1975 1980  
  
 Pro Ile Tyr Ala Thr Pro Ala Asp Pro Lys Ala Leu Leu Ser Ala  
 1985 1990 1995

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Ala	Val	Ala	Thr	Ser	Gln	Gly	Gly	Gly	Lys	Leu	Pro	Glu	Ser	Phe
	2000					2005					2010			
Met	Ser	Leu	Trp	Arg	Phe	Pro	His	Met	Leu	Glu	Asn	Ala	Arg	Gly
	2015					2020					2025			
Met	Val	Ser	Gln	Leu	Thr	Gln	Phe	Gly	Ser	Thr	Leu	Gln	Asn	Ile
	2030					2035					2040			
Ile	Glu	Arg	Gln	Asp	Ala	Glu	Ala	Leu	Asn	Ala	Leu	Leu	Gln	Asn
	2045					2050					2055			
Gln	Ala	Ala	Glu	Leu	Ile	Leu	Thr	Asn	Leu	Ser	Ile	Gln	Asp	Lys
	2060					2065					2070			
Thr	Ile	Glu	Glu	Leu	Asp	Ala	Glu	Lys	Thr	Val	Leu	Glu	Lys	Ser
	2075					2080					2085			
Lys	Ala	Gly	Ala	Gln	Ser	Arg	Phe	Asp	Ser	Tyr	Gly	Lys	Leu	Tyr
	2090					2095					2100			
Asp	Glu	Asn	Ile	Asn	Ala	Gly	Glu	Asn	Gln	Ala	Met	Thr	Leu	Arg
	2105					2110					2115			
Ala	Ser	Ala	Ala	Gly	Leu	Thr	Thr	Ala	Val	Gln	Ala	Ser	Arg	Leu
	2120					2125					2130			
Ala	Gly	Ala	Ala	Ala	Asp	Leu	Val	Pro	Asn	Ile	Phe	Gly	Phe	Ala
	2135					2140					2145			
Gly	Gly	Gly	Ser	Arg	Trp	Gly	Ala	Ile	Ala	Glu	Ala	Thr	Gly	Tyr
	2150					2155					2160			
Val	Met	Glu	Phe	Ser	Ala	Asn	Val	Met	Asn	Thr	Glu	Ala	Asp	Lys
	2165					2170					2175			
Ile	Ser	Gln	Ser	Glu	Thr	Tyr	Arg	Arg	Arg	Arg	Gln	Glu	Trp	Glu
	2180					2185					2190			
Ile	Gln	Arg	Asn	Asn	Ala	Glu	Ala	Glu	Leu	Lys	Gln	Ile	Asp	Ala
	2195					2200					2205			
Gln	Leu	Lys	Ser	Leu	Ala	Val	Arg	Arg	Glu	Ala	Ala	Val	Leu	Gln
	2210					2215					2220			
Lys	Thr	Ser	Leu	Lys	Thr	Gln	Gln	Glu	Gln	Thr	Gln	Ser	Gln	Leu
	2225					2230					2235			

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Ala Phe Leu Gln Arg Lys Phe Ser Asn Gln Ala Leu Tyr Asn Trp  
2240 2245 2250

Leu Arg Gly Arg Leu Ala Ala Ile Tyr Phe Gln Phe Tyr Asp Leu  
2255 2260 2265

Ala Val Ala Arg Cys Leu Met Ala Glu Gln Ala Tyr Arg Trp Glu  
2270 2275 2280

Leu Asn Asp Asp Ser Ala Arg Phe Ile Lys Pro Gly Ala Trp Gln  
2285 2290 2295

Gly Thr Tyr Ala Gly Leu Leu Ala Gly Glu Thr Leu Met Leu Ser  
2300 2305 2310

Leu Ala Gln Met Glu Asp Ala His Leu Lys Arg Asp Lys Arg Ala  
2315 2320 2325

Leu Glu Val Glu Arg Thr Val Ser Leu Ala Glu Val Tyr Ala Gly  
2330 2335 2340

Leu Pro Lys Asp Asn Gly Pro Phe Ser Leu Ala Gln Glu Ile Asp  
2345 2350 2355

Lys Leu Val Ser Gln Gly Ser Gly Ser Ala Gly Ser Gly Asn Asn  
2360 2365 2370

Asn Leu Ala Phe Gly Ala Gly Thr Asp Thr Lys Thr Ser Leu Gln  
2375 2380 2385

Ala Ser Val Ser Phe Ala Asp Leu Lys Ile Arg Glu Asp Tyr Pro  
2390 2395 2400

Ala Ser Leu Gly Lys Ile Arg Arg Ile Lys Gln Ile Ser Val Thr  
2405 2410 2415

Leu Pro Ala Leu Leu Gly Pro Tyr Gln Asp Val Gln Ala Ile Leu  
2420 2425 2430

Ser Tyr Gly Asp Lys Ala Gly Leu Ala Asn Gly Cys Glu Ala Leu  
2435 2440 2445

Ala Val Ser His Gly Met Asn Asp Ser Gly Gln Phe Gln Leu Asp  
2450 2455 2460

Phe Asn Asp Gly Lys Phe Leu Pro Phe Glu Gly Ile Ala Ile Asp

2465

2470

2475

Gln Gly Thr Leu Thr Leu Ser Phe Pro Asn Ala Ser Met Pro Glu  
 2480 2485 2490

Lys Gly Lys Gln Ala Thr Met Leu Lys Thr Leu Asn Asp Ile Ile  
 2495 2500 2505

Leu His Ile Arg Tyr Thr Ile Lys  
 2510 2515

&lt;210&gt; 8

&lt;211&gt; 1189

&lt;212&gt; PRT

&lt;213&gt; Photorhabdus luminescens,

&lt;400&gt; 8

Met Ser Glu Ser Leu Phe Thr Gln Thr Leu Lys Glu Ala Arg Arg Asp  
 1 5 10 15

Ala Leu Val Ala His Tyr Ile Ala Thr Gln Val Pro Ala Asp Leu Lys  
 20 25 30

Glu Ser Ile Gln Thr Ala Asp Asp Leu Tyr Glu Tyr Leu Leu Leu Asp  
 35 40 45

Thr Lys Ile Ser Asp Leu Val Thr Thr Ser Pro Leu Ser Glu Ala Ile  
 50 55 60

Gly Ser Leu Gln Leu Phe Ile His Arg Ala Ile Glu Gly Tyr Asp Gly  
 65 70 75 80

Thr Leu Ala Asp Ser Ala Lys Pro Tyr Phe Ala Asp Glu Gln Phe Leu  
 85 90 95

Tyr Asn Trp Asp Ser Phe Asn His Arg Tyr Ser Thr Trp Ala Gly Lys  
 100 105 110

Glu Arg Leu Lys Phe Tyr Ala Gly Asp Tyr Ile Asp Pro Thr Leu Arg  
 115 120 125

Leu Asn Lys Thr Glu Ile Phe Thr Ala Phe Glu Gln Gly Ile Ser Gln  
 130 135 140

Gly Lys Leu Lys Ser Glu Leu Val Glu Ser Lys Leu Arg Asp Tyr Leu  
 145 150 155 160

Ile Ser Tyr Asp Thr Leu Ala Thr Leu Asp Tyr Ile Thr Ala Cys Gln  
 Page 43

Gly Lys Asp Asn Lys Thr Ile Phe Phe Ile Gly Arg Thr Gln Asn Ala  
180 185 190

Pro Tyr Ala Phe Tyr Trp Arg Lys Leu Thr Leu Val Thr Asp Gly Gly  
195 200 205

Lys Leu Lys Pro Asp Gln Trp Ser Glu Trp Arg Ala Ile Asn Ala Gly  
210 215 220

Ile Ser Glu Ala Tyr Ser Gly His Val Glu Pro Phe Trp Glu Asn Asn  
225 230 235 240

Lys Leu His Ile Arg Trp Phe Thr Ile Ser Lys Glu Asp Lys Ile Asp  
245 250 255

Phe Val Tyr Lys Asn Ile Trp Val Met Ser Ser Asp Tyr Ser Trp Ala  
260 265 270

Ser Lys Lys Lys Ile Leu Glu Leu Ser Phe Thr Asp Tyr Asn Arg Val  
275 280 285

Gly Ala Thr Gly Ser Ser Ser Pro Thr Glu Val Ala Ser Gln Tyr Gly  
290 295 300

Ser Asp Ala Gln Met Asn Ile Ser Asp Asp Gly Thr Val Leu Ile Phe  
305 310 315 320

Gln Asn Ala Gly Gly Ala Thr Pro Ser Thr Gly Val Thr Leu Cys Tyr  
325 330 335

Asp Ser Gly Asn Val Ile Lys Asn Leu Ser Ser Thr Gly Ser Ala Asn  
340 345 350

Leu Ser Ser Lys Asp Tyr Ala Thr Thr Lys Leu Arg Met Cys His Gly  
355 360 365

Gln Ser Tyr Asn Asp Asn Asn Tyr Cys Asn Phe Thr Leu Ser Ile Asn  
370 375 380

Thr Ile Glu Phe Thr Ser Tyr Gly Thr Phe Ser Ser Asp Gly Lys Gln  
385 390 395 400

Phe Thr Pro Pro Ser Gly Ser Ala Ile Asp Leu His Leu Pro Asn Tyr  
405 410 415

Val Asp Leu Asn Ala Leu Leu Asp Ile Ser Leu Asp Ser Leu Leu Asn  
 420 425 430  
 Tyr Asp Val Gln Gly Gln Phe Gly Gly Ser Asn Pro Val Asp Asn Phe  
 435 440 445  
 Ser Gly Pro Tyr Gly Ile Tyr Leu Trp Glu Ile Phe Phe His Ile Pro  
 450 455 460  
 Phe Leu Val Thr Val Arg Met Gln Thr Glu Gln Arg Tyr Glu Asp Ala  
 465 470 475 480  
 Asp Thr Trp Tyr Lys Tyr Ile Phe Arg Ser Ala Gly Tyr Arg Asp Ala  
 485 490 495  
 Asn Gly Gln Leu Ile Met Asp Gly Ser Lys Pro Arg Tyr Trp Asn Val  
 500 505 510  
 Met Pro Leu Gln Leu Asp Thr Ala Trp Asp Thr Thr Gln Pro Ala Thr  
 515 520 525  
 Thr Asp Pro Asp Val Ile Ala Met Ala Asp Pro Met His Tyr Lys Leu  
 530 535 540  
 Ala Ile Phe Leu His Thr Leu Asp Leu Leu Ile Ala Arg Gly Asp Ser  
 545 550 555 560  
 Ala Tyr Arg Gln Leu Glu Arg Asp Thr Leu Val Glu Ala Lys Met Tyr  
 565 570 575  
 Tyr Ile Gln Ala Gln Gln Leu Leu Gly Pro Arg Pro Asp Ile His Thr  
 580 585 590  
 Thr Asn Thr Trp Pro Asn Pro Thr Leu Ser Lys Glu Ala Gly Ala Ile  
 595 600 605  
 Ala Thr Pro Thr Phe Leu Ser Ser Pro Glu Val Met Thr Phe Ala Ala  
 610 615 620  
 Trp Leu Ser Ala Gly Asp Thr Ala Asn Ile Gly Asp Gly Asp Phe Leu  
 625 630 635 640  
 Pro Pro Tyr Asn Asp Val Leu Leu Gly Tyr Trp Asp Lys Leu Glu Leu  
 645 650 655  
 Arg Leu Tyr Asn Leu Arg His Asn Leu Ser Leu Asp Gly Gln Pro Leu  
 660 665 670

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Asn Leu Pro Leu Tyr Ala Thr Pro Val Asp Pro Lys Thr Leu Gln Arg  
           675                          680                          685  
  
 Gln Gln Ala Gly Gly Asp Gly Thr Gly Ser Ser Pro Ala Gly Gly Gln  
       690                          695                          700  
  
 Gly Ser Val Gln Gly Trp Arg Tyr Pro Leu Leu Val Glu Arg Ala Arg  
 705                          710                          715                          720  
  
 Ser Ala Val Ser Leu Leu Thr Gln Phe Gly Asn Ser Leu Gln Thr Thr  
                           725                          730                          735  
  
 Leu Glu His Gln Asp Asn Glu Lys Met Thr Leu Leu Leu Gln Thr Gln  
                           740                          745                          750  
  
 Gln Gln Ala Ile Leu Lys Gln Gln His Asp Ile Gln Gln Asn Asn Leu  
           755                          760                          765  
  
 Lys Gly Leu Gln His Ser Leu Thr Ala Leu Gln Ala Ser Arg Asp Gly  
       770                          775                          780  
  
 Ala Thr Leu Arg Gln Lys His Tyr Ser Asp Leu Ile Asn Gly Gly Leu  
 785                          790                          795                          800  
  
 Ser Ala Ala Glu Ile Ala Gly Leu Thr Leu Arg Ser Thr Ala Met Ile  
                           805                          810                          815  
  
 Thr Asn Gly Val Ala Thr Gly Leu Leu Ile Ala Gly Gly Ile Ala Asn  
                           820                          825                          830  
  
 Ala Val Pro Asn Val Phe Gly Leu Ala Asn Gly Gly Ser Glu Trp Gly  
           835                          840                          845  
  
 Ala Pro Leu Ile Gly Ser Gly Gln Ala Thr Gln Val Gly Ala Gly Ile  
       850                          855                          860  
  
 Gln Asp Gln Ser Ala Gly Ile Ser Glu Val Thr Ala Gly Tyr Gln Arg  
 865                          870                          875                          880  
  
 Arg Gln Glu Glu Trp Ala Leu Gln Arg Asp Ile Ala Asp Asn Glu Ile  
                           885                          890                          895  
  
 Thr Gln Leu Asp Ala Gln Ile Gln Ser Leu Gln Glu Gln Ile Thr Met  
           900                          905                          910  
  
 Ala Gln Lys Gln Ile Thr Leu Ser Glu Thr Glu Gln Ala Asn Ala Gln  
       915                          920                          925

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Ala Ile Tyr Asp Leu Gln Thr Thr Arg Phe Thr Gly Gln Ala Leu Tyr  
930 935 940

Asn Trp Met Ala Gly Arg Leu Ser Ala Leu Tyr Tyr Gln Met Tyr Asp  
945 950 955 960

Ser Thr Leu Pro Ile Cys Leu Gln Ala Lys Ala Ala Leu Val Gln Glu  
965 970 975

Leu Gly Glu Lys Glu Ser Asp Ser Leu Phe Gln Val Pro Val Trp Asn  
980 985 990

Asp Leu Trp Gln Gly Leu Leu Ala Gly Glu Gly Leu Ser Ser Glu Leu  
995 1000 1005

Gln Lys Leu Asp Ala Ile Trp Leu Ala Arg Gly Gly Ile Gly Leu  
1010 1015 1020

Glu Ala Ile Arg Thr Val Ser Leu Asp Thr Leu Phe Gly Thr Gly  
1025 1030 1035

Thr Leu Ser Glu Asn Ile Asn Lys Val Leu Asn Gly Glu Thr Val  
1040 1045 1050

Ser Pro Ser Gly Gly Val Thr Leu Ala Leu Thr Gly Asp Ile Phe  
1055 1060 1065

Gln Ala Thr Leu Asp Leu Ser Gln Leu Gly Leu Asp Asn Ser Tyr  
1070 1075 1080

Asn Leu Gly Asn Glu Lys Lys Arg Arg Ile Lys Arg Ile Ala Val  
1085 1090 1095

Thr Leu Pro Thr Leu Leu Gly Pro Tyr Gln Asp Leu Glu Ala Thr  
1100 1105 1110

Leu Val Met Gly Ala Glu Ile Ala Ala Leu Ser His Gly Val Asn  
1115 1120 1125

Asp Gly Gly Arg Phe Val Thr Asp Phe Asn Asp Ser Arg Phe Leu  
1130 1135 1140

Pro Phe Glu Gly Arg Asp Ala Thr Thr Gly Thr Leu Glu Leu Asn  
1145 1150 1155

Ile Phe His Ala Gly Lys Glu Gly Thr Gln His Glu Leu Val Ala  
Page 47

1160

1165

1170

Asn Leu Ser Asp Ile Ile Val His Leu Asn Tyr Ile Ile Arg Asp  
 1175 1180 1185

Ala

<210> 9  
 <211> 1043  
 <212> PRT  
 <213> Photorhabdus luminescens,

&lt;400&gt; 9

Met Ser Pro Ser Glu Thr Thr Leu Tyr Thr Gln Thr Pro Thr Val Ser  
 1 5 10 15

Val Leu Asp Asn Arg Gly Leu Ser Ile Arg Asp Ile Gly Phe His Arg  
 20 25 30

Ile Val Ile Gly Gly Asp Thr Asp Thr Arg Val Thr Arg His Gln Tyr  
 35 40 45

Asp Ala Arg Gly His Leu Asn Tyr Ser Ile Asp Pro Arg Leu Tyr Asp  
 50 55 60

Ala Lys Gln Ala Asp Asn Ser Val Lys Pro Asn Phe Val Trp Gln His  
 65 70 75 80

Asp Leu Ala Gly His Ala Leu Arg Thr Glu Ser Val Asp Ala Gly Arg  
 85 90 95

Thr Val Ala Leu Asn Asp Ile Glu Gly Arg Ser Val Met Thr Met Asn  
 100 105 110

Ala Thr Gly Val Arg Gln Thr Arg Arg Tyr Glu Gly Asn Thr Leu Pro  
 115 120 125

Gly Arg Leu Leu Ser Val Ser Glu Gln Val Phe Asn Gln Glu Ser Ala  
 130 135 140

Lys Val Thr Glu Arg Phe Ile Trp Ala Gly Asn Thr Thr Ser Glu Lys  
 145 150 155 160

Glu Tyr Asn Leu Ser Gly Leu Cys Ile Arg His Tyr Asp Thr Ala Gly  
 165 170 175

Val Thr Arg Leu Met Ser Gln Ser Leu Ala Gly Ala Met Leu Ser Gln  
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Ser His Gln Leu Leu Ala Glu Gly Gln Glu Ala Asn Trp Ser Gly Asp  
195 200 205

Asp Glu Thr Val Trp Gln Gly Met Leu Ala Ser Glu Val Tyr Thr Thr  
210 215 220

Gln Ser Thr Thr Asn Ala Ile Gly Ala Leu Leu Thr Gln Thr Asp Ala  
225 230 235

Lys Gly Asn Ile Gln Arg Leu Ala Tyr Asp Ile Ala Gly Gln Leu Lys  
245 250 255

Gly Ser Trp Leu Thr Val Lys Gly Gln Ser Glu Gln Val Ile Val Lys  
260 265 270

Ser Leu Ser Trp Ser Ala Ala Gly His Lys Leu Arg Glu Glu His Gly  
275 280 285

Asn Gly Val Val Thr Glu Tyr Ser Tyr Glu Pro Glu Thr Gln Arg Leu  
290 295 300

Ile Gly Ile Thr Thr Arg Arg Ala Glu Gly Ser Gln Ser Gly Ala Arg  
305 310 315 320

Val Leu Gln Asp Leu Arg Tyr Lys Tyr Asp Pro Val Gly Asn Val Ile  
325 330 335

Ser Ile His Asn Asp Ala Glu Ala Thr Arg Phe Trp Arg Asn Gln Lys  
340 345 350

Val Glu Pro Glu Asn Arg Tyr Val Tyr Asp Ser Leu Tyr Gln Leu Met  
355 360 365

Ser Ala Thr Gly Arg Glu Met Ala Asn Ile Gly Gln Gln Ser Asn Gln  
370 375 380

Leu Pro Ser Pro Val Ile Pro Val Pro Thr Asp Asp Ser Thr Tyr Thr  
385 390 395 400

Asn Tyr Leu Arg Thr Tyr Thr Tyr Asp Arg Gly Gly Asn Leu Val Gln  
405 410 415

Ile Arg His Ser Ser Pro Ala Thr Gln Asn Ser Tyr Thr Thr Asp Ile  
420 425 430

Thr Val Ser Ser Arg Ser Asn Arg Ala Val Leu Ser Thr Leu Thr Thr  
 435 440 445  
 Asp Pro Thr Arg Val Asp Ala Leu Phe Asp Ser Gly Gly His Gln Lys  
 450 455 460  
 Met Leu Ile Pro Gly Gln Asn Leu Asp Trp Asn Ile Arg Gly Glu Leu  
 465 470 475 480  
 Gln Arg Val Thr Pro Val Ser Arg Glu Asn Ser Ser Asp Ser Glu Trp  
 485 490 495  
 Tyr Arg Tyr Ser Ser Asp Gly Met Arg Leu Leu Lys Val Ser Glu Gln  
 500 505 510  
 Gln Thr Gly Asn Ser Thr Gln Val Gln Arg Val Thr Tyr Leu Pro Gly  
 515 520 525  
 Leu Glu Leu Arg Thr Thr Gly Val Ala Asp Lys Thr Thr Glu Asp Leu  
 530 535 540  
 Gln Val Ile Thr Val Gly Glu Ala Gly Arg Ala Gln Val Arg Val Leu  
 545 550 555 560  
 His Trp Glu Ser Gly Lys Pro Thr Asp Ile Asp Asn Asn Gln Val Arg  
 565 570 575  
 Tyr Ser Tyr Asp Asn Leu Leu Gly Ser Ser Gln Leu Glu Leu Asp Ser  
 580 585 590  
 Glu Gly Gln Ile Leu Ser Gln Glu Glu Tyr Tyr Pro Tyr Gly Gly Thr  
 595 600 605  
 Ala Ile Trp Ala Ala Arg Asn Gln Thr Glu Ala Ser Tyr Lys Phe Ile  
 610 615 620  
 Arg Tyr Ser Gly Lys Glu Arg Asp Ala Thr Gly Leu Tyr Tyr Tyr Gly  
 625 630 635 640  
 Tyr Arg Tyr Tyr Gln Pro Trp Val Gly Arg Trp Leu Ser Ala Asp Pro  
 645 650 655  
 Ala Gly Thr Val Asp Gly Leu Asn Leu Tyr Arg Met Val Arg Asn Asn  
 660 665 670  
 Pro Ile Thr Leu Thr Asp His Asp Gly Leu Ala Pro Ser Pro Asn Arg  
 675 680 685

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Asn Arg Asn Thr Phe Trp Phe Ala Ser Phe Leu Phe Arg Lys Pro Asp  
 690 695 700  
 Glu Gly Met Ser Ala Ser Met Arg Arg Gly Gln Lys Ile Gly Arg Ala  
 705 710 715 720  
 Ile Ala Gly Gly Ile Ala Ile Gly Gly Leu Ala Ala Thr Ile Ala Ala  
 725 730 735  
 Thr Ala Gly Ala Ala Ile Pro Val Ile Leu Gly Val Ala Ala Val Gly  
 740 745 750  
 Ala Gly Ile Gly Ala Leu Met Gly Tyr Asn Val Gly Ser Leu Leu Glu  
 755 760 765  
 Lys Gly Gly Ala Leu Leu Ala Arg Leu Val Gln Gly Lys Ser Thr Leu  
 770 775 780  
 Val Gln Ser Ala Ala Gly Ala Ala Ala Gly Ala Ser Ser Ala Ala Ala  
 785 790 795 800  
 Tyr Gly Ala Arg Ala Gln Gly Val Gly Val Ala Ser Ala Ala Gly Ala  
 805 810 815  
 Val Thr Gly Ala Val Gly Ser Trp Ile Asn Asn Ala Asp Arg Gly Ile  
 820 825 830  
 Gly Gly Ala Ile Gly Ala Gly Ser Ala Val Gly Thr Ile Asp Thr Met  
 835 840 845  
 Leu Gly Thr Ala Ser Thr Leu Thr His Glu Val Gly Ala Ala Ala Gly  
 850 855 860  
 Gly Ala Ala Gly Gly Met Ile Thr Gly Thr Gln Gly Ser Thr Arg Ala  
 865 870 875 880  
 Gly Ile His Ala Gly Ile Gly Thr Tyr Tyr Gly Ser Trp Ile Gly Phe  
 885 890 895  
 Gly Leu Asp Val Ala Ser Asn Pro Ala Gly His Leu Ala Asn Tyr Ala  
 900 905 910  
 Val Gly Tyr Ala Ala Gly Leu Gly Ala Glu Met Ala Val Asn Arg Ile  
 915 920 925  
 Met Gly Gly Gly Phe Leu Ser Arg Leu Leu Gly Arg Val Val Ser Pro  
 930 935 940

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Tyr Ala Ala Gly Leu Ala Arg Gln Leu Val His Phe Ser Val Ala Arg  
945 950 955 960

Pro Val Phe Glu Pro Ile Phe Ser Val Leu Gly Gly Leu Val Gly Gly  
965 970 975

Ile Gly Thr Gly Leu His Arg Val Met Gly Arg Glu Ser Trp Ile Ser  
980 985 990

Arg Ala Leu Ser Ala Ala Gly Ser Gly Ile Asp His Val Ala Gly Met  
995 1000 1005

Ile Gly Asn Gln Ile Arg Gly Arg Val Leu Thr Thr Thr Gly Ile  
1010 1015 1020

Ala Asn Ala Ile Asp Tyr Gly Thr Ser Ala Val Gly Ala Ala Arg  
1025 1030 1035

Arg Val Phe Ser Leu  
1040

<210> 10  
<211> 5  
<212> PRT  
<213> Photorhabdus luminescens, Serratia entomophila  
<400> 10

Arg Arg Arg Arg Glu  
1 5

<210> 11  
<211> 21  
<212> DNA  
<213> plasmid-Tn10

<400> 11  
atgacaagat gtgtatccac c

21